

ORGANIZATIONAL LEVEL MAINTENANCE

**INSPECTION AND PROOFLOAD TESTING
OF LIFTING SLINGS FOR AIRCRAFT AND RELATED COMPONENTS**

Reference Material

General Information	WP 003 00
Intermediate Level Maintenance	WP 005 00
Depot Level Maintenance.....	WP 006 00
Periodic Maintenance Requirements Manual, Lifting Slings for Aircraft and Related Components.....	NA 17-600-183-6-2
Preoperational Checklist, Lifting Slings for Aircraft and Related Components.....	NA 17-600-183-6-1
Support Equipment Cleaning, Preservation, and Corrosion Control.....	NA 17-1-125
The Naval Aviation Maintenance Program (NAMP).....	OPNAVINST 4790.2

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1. **SUPPORT EQUIPMENT REQUIRED.**

2. The following tools and support equipment are necessary to accomplish Organizational level maintenance of aircraft support equipment slings.

SUPPORT EQUIPMENT REQUIRED

Part Number, Type or Model Number	Nomenclature
	None

3. **MATERIALS REQUIRED.**

4. The following consumable maintenance materials are necessary to accomplish Organizational level maintenance of aircraft support equipment slings.

MATERIALS REQUIRED

Specification or Part Number (CAGE)	Nomenclature
---	Brush, Bristle (nonmetallic)
---	Rags, Wiping (Cloth)
ASSE Z87.1	Goggles, Industrial
MIL-PRF-16173	Corrosion Preventive Compound
MIL-C-85054	Corrosion Preventive Compound (Amlguard)
MIL-G-87066	Gloves, Protective
A-A-59291	Ink, Marking
MIL-PRF-2104	Lubricating Oil
MIL-PRF-32033 (Formerly VV-L-800)	Lubricating Oil, General Purpose, Preservative

5. **INTRODUCTION.**

6. This work package provides instructions for Organizational level inspection and preventive maintenance of aircraft support equipment slings and lifting devices that are used for lifting aircraft, engines, and related components. Aircraft support equipment slings are used at all levels of Navy and Marine Corps activities during aircraft maintenance and operations. Aircraft support equipment slings shall be maintained in configuration and used with strict adherence to applicable instructions. It is essential to have personnel involved in the use and maintenance of slings who are properly trained and supervised. The intent of this work package is to furnish information necessary to prevent failure of aircraft support equipment slings that could result in injury to personnel and damage to U.S. Navy equipment.

7. **APPLICATION.**

8. The instructions contained in this work package are applicable to all maintenance activities that use or have custody of aircraft support equipment slings. Reporting custodians may be Organizational, Intermediate, or Depot level activities. Since sling components are subject to wear, stress, and deterioration, inspections and preventive maintenance must be accomplished within prescribed intervals to prevent failures. Maintenance at the organizational level is confined to inspection, lubricating, marking, and storage.

9. **STANDARD OPERATING PRACTICES.**

10. Organizational level activities are primary users of aircraft support equipment slings. Slings and lifting devices shall be maintained in configuration and used with strict adherence to applicable instructions. The use of slings is subject to certain hazards that cannot be met by mechanical means alone, the exercise of intelligence, care, and common sense is required. It is essential to have personnel involved in the use and operation of slings and related equipment who are trained and supervised in the safe operation of the equipment and handling of the loads. Serious hazards are overloading, dropping or slipping of the load caused by improper hitching, snagging or obstructing free passage of the load, and using lifting equipment for a purpose for which it was not designed. All personnel using aircraft support equipment slings shall comply with the standard operating practices of WP 003 00. For proper installation of any sling, consult the applicable aircraft Maintenance Instruction Manual.

11. **SAFE WORKING LOAD (SWL).** The safe working load of a sling is the maximum load that shall be lifted or supported during regular use. The safe working load shall never be exceeded except during proofload testing. The sling safe working load must consider the angle of loading, type of hitch, abnormal operating conditions, and adverse environmental conditions. Know the safe working load of the sling before using it.

12. **REQUIREMENTS.**

13. All aircraft support equipment slings and lifting devices are subject to the preventive maintenance inspection schedule of Table 1. These are minimum requirements and shall take precedence over any less restrictive instructions listed in any other Navy publication. Organizational maintenance activities shall perform Acceptance Inspections and Preoperational Inspections for aircraft support equipment slings.

Table 1. Preventive Maintenance Inspection Schedule

	Acceptance Inspection	Preoperational Inspection	Periodic Inspections (Weeks)		
			13	52	104
1. Aircraft Support Equipment Slings	A	A	N/A	B	B
2. Main Aircraft Lifting Slings (Note 1)	A	A	B	B	B
<p>KEY: A. Performed by the reporting custodian, Organizational, Intermediate, or Depot. B. Performed by Intermediate Maintenance Activities.</p> <p>Note 1: Aircraft support equipment slings used to lift the entire aircraft as identified in Table 2.</p>					

14. Proofload Test. There is no requirement for annual proofload testing of aircraft support equipment slings. Proofload testing is conducted at new manufacture or after major repairs at the Intermediate or Depot level to verify the integrity of construction of the sling.

15. **SE CUSTODY AND MAINTENANCE HISTORY RECORDS.**

16. An SE Custody and Maintenance History Record, OPNAV 4790/51, shall be maintained for each aircraft support equipment sling or lifting device in accordance with OPNAVINST 4790.2.

17. **ACCEPTANCE INSPECTION.**

18. The reporting custodian shall perform an Acceptance Inspection when accepting a newly assigned item of support equipment. The inspection includes an inventory of all records and components that make up the aircraft support equipment sling, configuration verification, a preoperational inspection, and a functional check. The records inventory shall include a current SE Custody and Maintenance History Record, OPNAV 4790/51, a proofload tag and Test/Inspection Certification sticker (Figure 1), identification plate, tag, or stencil, VIDS/MAF historical files, and other applicable records. The reporting custodian shall initiate the Support Equipment Preoperational Record, OPNAV 4790/52. Verify sling configuration in accordance with applicable Illustrated Parts Breakdowns. Perform a Preoperational Inspection of the sling in accordance with NAVAIR 17-600-183-6-1. The reporting custodian shall also perform a no-load functional check to verify that movable adjusters, pivots, slides, gearing, etc. operate properly.

19. The receiving activity may elect to increase the depth of inspection if the condition of the sling warrants

such action. When the acceptance inspection is complete, the sling shall be promptly placed into service or preserved. The reporting custodian accomplishes a Transfer Inspection, which is basically the same as the Acceptance Inspection, before transferring an item of support equipment on a permanent basis.

20. If newly manufactured slings are received through the Navy supply system without proofload tags, initiate a Quality Deficiency Report (QDR) in accordance with OPNAVINST 4790.2 (Series) to the appropriate sling cognizant activity or FST and the Navy Inventory Control Point (NAVICP).

21. If slings are received from a Depot level maintenance activity without proofload tags, initiate a QDR in accordance with OPNAVINST 4790.2 to the appropriate sling cognizant activity or FST and the depot rework activity.



INK, MARKING
A-A-59291

1

22. **MARKING FABRIC SLINGS.** Slings with fabric webbing components shall be marked with sling part number and serial number on the webbing (Figure 2) if the sling assembly does not have a suitable identification tag or plate. Reporting custodians may also mark fabric slings for ownership. Use one-inch letters and contrasting white or black Ink, Marking, A-A-59291. The position of marking may be adjusted to accommodate various fabric webbing designs.

23. **PREOPERATIONAL INSPECTION.**

24. Aircraft support equipment slings shall be visually inspected by the person handling the sling before each use. The Preoperational Inspection is performed by the sling user, Organizational, Intermediate or Depot level personnel, prior to each use to verify that the sling is properly serviced and ready for use. Preoperational inspection requirements are specified in NAVAIR 17-600-183-6-1 and the following paragraphs. The preoperational inspection is a cursory visual inspection concerned with discovering gross deficiencies that present an immediate hazard to using the sling.

25. Perform an initial inspection of the overall sling assembly to determine critical areas for inspection. Critical areas are high stress areas such as the hoist hook attachment point, lifting rings, structural areas around primary lifting points, end attachments that connect to the load, and pivot points. Perform preoperational inspection of all sling elements with special attention to these critical areas.

26. **TAGS AND MARKING.** Inspect the sling for complete and legible proofload tag and Test/Inspection Certification sticker (Figure 1), identification plate, tag, or stencil. The proofload tag will be attached to the sling with a steel lanyard. The Test/Inspection Certification sticker will be affixed to the backside of the proofload tag. Know the safe working load of the sling before using it.

NOTE

The wire ropes of many slings are covered with leather, rubber or plastic boots to aid in protection against abrasion and corrosion. If the condition of the wire rope is in doubt, the covering over the questionable area may be removed for inspection.

27. **WIRE ROPE.** Wire rope shall be inspected as follows:

a. Inspect wire rope for kinks, bird cages, knots, crushing, fraying, stretching, abrasion, corrosion, and heat damage.

WARNING

Do not check for broken wires by running bare hands over the wire rope. Broken wires can cause severe cuts or punctures.

b. Inspect wire rope for broken wires. Broken wires can be detected by wrapping a cloth rag around the wire rope and pulling it along the entire length in both directions to feel for snags. Estimate rope condition at the section with the most deterioration. Count the number of broken wires in each rope lay length (pitch) and each strand lay length. The maximum number of broken wires allowed is:

(1) Six broken wires in one rope lay length, randomly distributed.

(2) Three broken wires in one strand per rope lay length, randomly distributed.

(3) One broken wire within one rope lay length of any end fitting.

c. Inspect wire rope terminals and fittings for wire slippage, deformation, elongation, cracks, wear, and corrosion.

28. **CHAIN.** Chain shall be inspected as follows:

a. Inspect chain for stretched or deformed links, wear, nicks, gouges, fractures, open welds, knots, and corrosion.

b. Inspect chain attachment fittings for security, deformation, wear, cracks, and corrosion. Chain links and attachments should hinge freely with adjacent links.

29. **STRUCTURAL MEMBERS.** Structural members shall be inspected as follows:

a. Inspect structural members for deformation, misalignment, wear, corrosion, loosening, slippage, fractures, open welds, nicks, and gouges.

b. Examine pivots, slides, screw adjusters, and gearing for deformation, misalignment, thread damage, cracks, and binding. Verify that these components operate properly.

30. **FABRIC WEBBING.** Fabric Webbing shall be inspected as follows:

a. Inspect fabric webbing for cuts, tears, fraying, chafing, abrasion, broken or loose stitches. There shall be no more than five broken or loose stitches per fabric webbing strap, randomly distributed.

b. Inspect fabric webbing for burns, fusing, melting, fading, discoloration, chemical damage, stains, fluid soaking, and mildew.

c. Inspect fabric webbing for dry rot, excessive stiffness, kinking, folded webbing, and missing wear pads.

d. Inspect fabric webbing fittings for deformation, cracks, nicks, gouges, and corrosion. Inspect for sharp edges or burrs that could cut the fabric webbing.

31. **HOOKS, HARDWARE, ATTACHMENTS, AND FITTINGS.** Hooks, hardware, attachments, and fittings shall be inspected as follows:

a. Inspect hooks for deformation, bending, twisting, increased throat opening, wear, cracks, nicks, gouges, and corrosion.

b. Inspect hardware, attachments, and fittings for deformation, elongation, wear, thread damage, cracks, nicks, gouges, corrosion, loosening, and other signs of imminent failure.

32. **PERIODIC INSPECTION.**

33. Periodic inspections are necessary to accomplish a thorough examination of an aircraft support equipment sling to detect primarily service-related defects and to ensure that the sling can safely continue in service until the next periodic inspection. Periodic inspection requirements for aircraft support equipment slings are specified in the following paragraphs, WP 005 00 and NAVAIR 17-600-183-6-2. Organizational maintenance activities shall forward all aircraft support equipment

slings to the appropriate Intermediate maintenance activity for 13 Week, 52 Week and 104 Week periodic inspections (Table 1). The foil Test/Inspection Certification sticker, which is affixed to the backside of the proofload tag, certifies the current 13 Week, 52 Week or 104 Week periodic inspection and indicates when the next periodic inspection is due.

34. **MAIN AIRCRAFT LIFTING SLINGS.** Main aircraft lifting slings are large, high capacity aircraft support equipment slings used for hoisting an entire aircraft from the pier to carrier deck and for statically lifting crash damaged or disabled aircraft at sea and ashore (Table 2). Main aircraft lifting slings are used infrequently and are often exposed to adverse environmental conditions during storage; thus, a limited 13 Week inspection is required to ensure sling serviceability during the 52 Week inspection interval.

35. **PRESERVATION.**

36. When it is known that a sling will not be used for an extended period of time, and environmental surroundings are potentially damaging, adequate steps shall be taken to protect and preserve the aircraft support equipment sling in a serviceable condition. Aircraft support equipment slings and lifting devices shall be preserved in accordance with NAVAIR 17-1-125. Prior to long term preservation (Category C), the aircraft support equipment sling must have a current 13 Week, 52 Week or 104 Week periodic inspection. When an aircraft support equipment sling is adequately preserved to Level II or Level III (Category C) long term preservation, the 13 Week, 52 Week and 104 Week periodic inspections are deferred, and the preserved slings should be removed from the preventive maintenance inspection schedule. During long term preservation, the periodic inspection cycle "clock" stops. Record on OPNAV 4790/51, SE Custody and Maintenance History Record, the date the sling is placed in preservation. Also record the remaining weeks left before the next periodic inspection is due. For all slings, preservation integrity inspections shall be performed per NAVAIR 17-1-125 to determine effectiveness of preservation.



LUBRICATING OIL, GENERAL PURPOSE,
PRESERVATIVE (WATER-DISPLACING, LOW
TEMPERATURE)
MIL-PRF-32033 (Formerly VV-L-800)

2



LUBRICATING OIL, INTERNAL COMBUSTION
ENGINE, COMBAT/TACTICAL SERVICE
MIL-PRF-2104

3



CORROSION PREVENTIVE COMPOUND, CLEAR
MIL-C-85054

4



CORROSION PREVENTIVE COMPOUND, SOLVENT
CUTBACK, COLD-APPLICATION
MIL-PRF-16173

5

37. **WIRE ROPE SLINGS.** Wire rope must be well lubricated prior to preservation. Lightly coat wire ropes

with Lubricating Oil, MIL-PRF-32033 (formerly VV-L-800) or MIL-PRF-2104. Preserve wire ropes with Corrosion Preventive Compound, MIL-C-85054 or MIL-PRF-16173.

38. Slings that are subjected to any of the following conditions during preservation are an exception to the "clock stop" rule, and all preventive maintenance inspections not compiled during the preservation period shall be completed prior to use.

a. Slings exposed to any condition that could result in damage during storage or shipping.

b. Slings that fail any preservation integrity inspection per NAVAIR 17-1-125.

39. Upon de preservation, the periodic inspection cycle "clock" shall resume. The sling shall be subjected to a preoperational inspection per NAVAIR 17-600-183-6-1 prior to use. Record on OPNAV 4790/51, SE Custody and Maintenance History Record, the date the sling is removed from preservation. Also record the date of the next 52 week or 104 week periodic inspection. This date is determined by adding the weeks remaining on the current inspection when placed in preservation to the date the sling is removed from preservation. A new foil Test/Inspection Certification Sticker, P/N 4SE00726-1 (28638), shall be affixed to the backside of the proofload tag indicating when the respective 13 Week, 52 Week or 104 week periodic inspection is due. The new Test/Inspection Certification sticker shall identify the activity performing the inspection, activity 3-M organizational code (Unit Identification Code, UIC), inspection due date, sling part number, CAGE, and the SWL of the sling. When an aircraft support equipment sling is de preserved, it must resume its formal periodic inspection schedule, or it must be re preserved within two weeks (14 days).

Table 2. Main Aircraft Lifting Slings (Sheet 1 of 2)

Type A/C	Manufacturer	Part Number	NSN
A-4,TA-4	McDonnell-Douglas Corp.	5819505-501 or K5447346-501	1730-00-087-0293 or 1730-00-603-9388
AV-8B	McDonnell-Douglas Corp.	75D110000-1005	1730-01-374-1319
C-2	Grumman Corp.	123GT40027	1730-00-966-6033
E-2C/C-2	Grumman Corp.	123GT10199 or 123SME50642-1	1730-00-913-2086 or 1730-01-215-5763
EA-6B	Grumman Corp.	1128SME40001-3	1730-01-004-1836
F-4	McDonnell-Douglas Corp.	MDE32184-1	1730-00-788-0175
F-14	Grumman Corp.	A51S61460-1	1730-00-402-9864
F/A-18	McDonnell-Douglas Corp.	74D110003-1001	1730-01-062-4048
S-3	Lockheed Aircraft Corp.	B982-101	1730-00-147-3050
T-2	Rockwell International	E3743	1730-00-622-6689
T-39	Rockwell International	465-810021-011	1730-01-199-4134
V-22	Bell-Boeing	901-220-933-101	1730-01-266-2246

AH-IT/W	Bell Helicopter Textron	T101897	1680-00-543-7292
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Table 2. Main Aircraft Lifting Slings (Sheet 2 of 2)

UH-1,UH-1N	Bell Helicopter Textron	204-011-178-1	1680-00-408-2964
H-2	Kaman Aerospace Corp.	K604010-5 or K604010-7	1730-00-140-3759 or 1730-01-327-0298
H-3	Sikorsky Aircraft Corp.	S6170-70004-8, S6170-70004-9, or S6170-70004-041	1730-00-824-6014 or 1730-01-363-6931
H-46	Boeing Helicopter Co. Aeroquip Corp.	A02G1348-1 or FE300059- 01	1730-01-011-8637
CH-53D/ RH-53D	Sikorsky Aircraft Corp.	65700-70092-041 or 65700- 70092-042	1730-00-050-9512 or 1730-00-129-8637
CH-53E/ MH-53E	Sikorsky Aircraft Corp.	65720-70018-041	1730-01-140-3481
H-60	Sikorsky Aircraft Corp.	70073-85000-011 or 70073-85000-013	1730-01-251-6535 or 1730-01-367-5166

NOTE: Omission of a main aircraft lifting sling from this table does not exempt it from the 13 Week periodic inspection.

40. **STORAGE.**

41. Aircraft support equipment slings shall be stored and protected from mechanical damage, kinking, corrosive action, moisture, salt water, and extreme heat. Slings shall be stored indoors in a clean, dry, well-ventilated area. Where practical, slings shall be stored on overhead storage racks to prevent accidental damage. Avoid laying slings on asphalt or concrete floors.

42. **WIRE ROPE SLINGS.** Store wire rope slings in a clean, dry place indoors and protect them from kinking or other mechanical damage. Wire rope slings must also be protected to prevent contact with moisture, acids, excessive heat, or other elements that could cause damage.



Fabric webbing slings shall be stored in a cool, dry, and dark place to minimize the effects of ultraviolet light damage caused by sunlight or arc welding flash.

43. **FABRIC WEBBING SLINGS.** Store fabric webbing slings in such a way as to prevent contact with sharp objects, high temperatures in excess of 200°F, direct sunlight, and chemically active environments. Fabric materials deteriorate rapidly from prolonged exposure to sunlight or excessive heat, severely reducing strength and service life.